99B-185

# 4.5 PSP Cover Sheet

Proposal Title:	Monitoring Tidal W	etland Rehabilitations in the North Bay Region	on of
	San Francisco Bay and Delta		
Applicant Name:	John Takekawa, PhD		
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Email:	john_takekawa@us	gs.gov	
Amount of funding	requested: \$689,000	for 3 years	
Indicate the topic for	r which you are applyi	ing (check only one box).	
□ Fish Passage/Fish		□ Introduced Species	
■ Habitat Restoration		□ Fish Management/Hatchery	
□ Local Watershed S	==	□ Environmental Education	
□ Water Quality	stewardship	- Environmental Education	
□ water Quarity			
Does the proposal ac	Idress a specified Foci	used Action? X yesno	
What county or cour	nties is the proposed p	roject located in? Napa, Sonoma, Solano	
		•	
Indicate the geograp	hic area of your propo	sal:	
□ Sacramento River	Mainstem	□ East Side Trib:	
□ Sacramento Trib:		Suisun Marsh and Bay	
□ San Joaquin River	Mainstem	■ North Bay/South Bay	
□ San Joaquin Trib:		☐ Landscape (entire Bay-Delta watershed	
□ Delta:		□ Other:	
Indicate the primary	species which the pro	posal addresses (check all that apply):	
		ies fall run chinook salmon	
□ Winter-run chinoc		☐ Spring-run chinook salmon	
□ Late-fall run chino	ook salmon	□ Fall-run chinook salmon	
□ Delta smelt		□ Longfin smelt	
Splittail		□ Steelhead trout	
□ Green sturgeon		Striped bass	
Migratory birds     ✓ Migratory bir		□ All chinook species	
	Unweet Mica Clare		
■ Other: Sait Marsh	Harvest Mice, Clappe	er Rails   All anadromous salmonids	•
		rget (s) that the project addresses. Include pag	ţе
numbers from Janua	ry 1999 version of the	ERP Volume I and II:	
sfbe-l			

This project addresses several topics in the CALFED Ecosystem Restoration Program Plan. It is located in the North Bay zone (V. II, p. 75). Elements of the project address saline emergent wetland restoration (V.I., p. 9), and it may aid recovery and information on several species of importance including Delta smelt (V. I, p. 10), Splittail (V. I, p. 10), resident fishes (V. I, p. 11), Red-legged frogs (V. I, p. 11), California Clapper Rail (V. I, p. 12), California Black Rail (V. I., p. 12), Suisun Song Sparrow (V. I., p. 12), Salt Marsh Harvest Mouse (V. I, p. 12), Shorebird and Wading Birds (V. I, p. 12), and Waterfowl (V. I, p. 12), Levees and bank protection (V. I, p. 13), Invasive Aquatic Organisms (V. I, p. 14), and Invasive Riparian and Salt Marsh Plants (V. I, p. 14). Habitats addressed included Natural Sediment Supply (V. I., p. 27), Floodplains and Processes (V. I, p. 38), Tidal Perennial Aquatic Habitat (V. I, p. 75), Saline Emergent Wetlands (V. I, p. 88). Finally, this project provides a strong basis for establishing adaptive management (V. III, p. 11) and biological monitoring (V. III, p. 35) in wetland restoration.

Indicate the type of applicant (check of	nly one box):
☐ State agency	■ Federal agency
□ Public/Non-profit joint venture	□ Non-profit
□ Local government/district	□ Private party
□ University	□ Other:
Indicate the type of project (check only	one box):
□ Planning	☐ Implementation
Monitoring	□ Education
□ Research	
By signing below, the applicant declar	es the following:
1) the truthfulness of all representation	s in their proposal;
2) The individual signing the form is e	ntitled to submit the application on behalf of the applicant
(if the applicant is an entity or organiza	ation); and
	on has read and understood the conflict of interest and Section 2.4) and waives any and all rights to privacy and

confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

John Y. Takekawa, PhD Printed name of applicant

Signature of applicant

### Monitoring Tidal Wetland Rehabilitations in the North Bay Region of the San Francisco Bay and Delta

Habitat Restoration: channel, floodplain and marshes

A Proposal to the CALFED Bay-Delta Program 16 April 1999

#### Principal Investigators:

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Type of Organization: Federal Government

Tax Status: Tax Exempt

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#### III. EXECUTIVE SUMMARY

#### Monitoring Tidal Wetland Rehabilitations in the North Bay Region of the San Francisco Bay and Delta

John Y. Takekawa U. S. Geological Survey – Biological Resources Division Western Ecological Research Center, San Francisco Bay Estuary Field Station

> Michael A. Bias Ducks Unlimited Western Regional Office, Rancho Cordova

Michael K. Saiki
U. S. Geological Survey – Biological Resources Division
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The San Francisco Bay-Delta is a critical resource for many endemic fish, wildlife, and plant species as well as a major wintering area for migratory waterbirds on the Pacific Flyway. Two-thirds of the remaining salt marsh ecosystems and tidal flat habitats on the Pacific coast are located in the estuary. The North Bay region, including San Pablo and Suisun Bay, comprise the largest remaining contiguous expanse of undeveloped baylands, and several wetland rehabilitation projects are currently underway or proposed for these areas.

Many endemic species will benefit from the restoration of these tidal salt marshes with their characteristic California Cordgrass (Spartina foliosa) and Pickleweed (Salicornia virginica) plant communities. Fish species that may benefit from increased amount of tidal wetland habitats include species with special status, such as Delta Smelt (Hypomesus transpacificus), Sacramento Splittail (Pogonichthys macrolepidotus), and Tidewater Goby (Eucyclogobius newberryi). California Clapper Rail, California Black Rail (Laterallus jamaicensis coturniculus), Suisun Song Sparrow (Melospiza melodia samuelis), and Salt Marsh Harvest Mouse are among the target wildlife species for restoration. In addition, management for specific elements within projects may enhance their value for migratory shorebirds and waterfowl and reduce the invasion of non-indigenous species such as Smooth Cordgrass (Spartina alterniflora) and Perennial Pepperweed (Lepidium latifolium).

Our proposed monitoring study will include two sites in San Pablo Bay and one site in Suisun Bay. The U. S. Fish and Wildlife Service ("Service") manages 5,700 ha with an additional 2,800 ha approved for acquisition in San Pablo Bay; many of these areas are historic salt marshes that were diked and drained for agriculture that will be restored. Two wetland rehabilitation projects, Cullinan Ranch (606 ha) and Tolay Creek (176 ha), are currently being undertaken by the San Pablo Bay National Wildlife Refuge in cooperation with several local partners (including California Department of Fish and Game, Ducks Unlimited, Southern Sonoma County Resource Conservation District, Save San Francisco Bay Association, City of Vallejo). Our studies in Suisun Bay will include the Joice Island unit (850 ha) of the California Department of Fish and Game as a comparison site. Although most of the Suisun Marsh is managed for waterfowl hunting, the Joice Island unit contains nearly 250 ha of tidal marsh which

provides unique management challenges to maximize waterfowl use within salt marsh habitats.

Monitoring broad-based biophysical results from wetland projects is a crucial step in rehabilitation which was identified by the CALFED Bay-Delta Program (Ecosystem Restoration Projects and Programs). Documentation of environmental change is requisite to the development of adaptive management strategies. Effective restoration and management of habitat for listed species cannot be accomplished if sound basic knowledge of habitat functions and species requirements is not available. Few guidelines exist which indicate how monitoring should be conducted for adaptive management of projects and whether specific features within restoration projects may enhance target species. Despite its vital role, monitoring has traditionally received little effort or funding in either pre or post-project planning. For example, construction costs to complete the Cullinan Ranch and Tolay Creek projects exceed \$2.5 million dollars, but funding for biophysical monitoring has been limited to a few thousand dollars. CALFED partly supported these two restoration projects in 1998 and required a biological monitoring plan; however, a separately submitted monitoring proposal was not funded although it was highly rated. Current funds available for monitoring these ongoing projects are less than one-third of the costs identified in the monitoring plan.

The goal of this project is to conduct monitoring studies and experiments that will aid in the rehabilitation and adaptive management of tidal salt marsh habitats. We propose four tasks to examine the rehabilitation efforts: (1) refine a general monitoring framework for tidal salt marsh rehabilitation projects, (2) document community structure and immigration of fish species into restored areas; (3) study genetic and morphologic differentiation of Salt Marsh Harvest Mice and Western Harvest Mice to validate field identification and examine hybridization: and (4) test through experiments the wetland features that enhance use by waterbird species.

We anticipate no adverse direct or indirect effects from this project. The overall project is coordinated with, and has the support of, the California Department of Fish and Game, U. S. Fish and Wildlife Service, Ducks Unlimited, the Southern Sonoma County Resource Conservation District, and the Save San Francisco Bay Association. The project is compatible with CALFED objectives of habitat restoration of saline emergent wetlands and restoration of habitat for targeted species, such as the California Clapper Rail and Salt Marsh Harvest Mouse. Monitoring will be conducted semiannually and data evaluation will be conducted for all objectives (Monitoring and Data Collection Methodology). The total cost of this proposed project is S689,000 for three years.

John Y. Takekawa has been a federal research wildlife biologist for more than 13 years, and is now with the Biological Resources Division of U. S. Geological Survey (BRD, Vallejo). He established the San Francisco Bay Estuary Field Station in 1995, his research specialty is the ecology of migratory waterbirds and his geographic specialty is the San Francisco Bay estuary. Michael A. Bias is a regional biologist for Ducks Unlimited, Western Regional Office, Rancho Cordova. He is the project manager for the Cullinan and Tolay Creek Rehabilitation projects and holds a doctorate from UC Berkeley in Wildland Resource Science on Ecology of the Salt Marsh Harvest Mouse in the San Pablo Bay. Michael K. Saiki (BRD, Dixon) has conducted several field projects on fish communities in California during the past 15 years. His studies include abundance and distribution of fishes in rivers or small estuaries in which fish populations were documented and related to the food supply, water quality, or other environmental variables.

#### IV. PROJECT DESCRIPTION

#### Proposed Scope of Work

The goal of this project is to conduct monitoring studies and experiments that will aid in the rehabilitation and adaptive management of tidal salt marsh habitats. We propose to examine five tasks to examine the rehabilitation efforts: (1) refine a general monitoring framework for tidal salt marsh rehabilitation projects, (2) document community structure and immigration of fish species; (3) study genetic and morphologic differentiation of Salt Marsh Harvest Mice and Western Harvest Mice to validate field identification and examine hybridization: and (4) test experimentally the wetland features that enhance use by waterbird species.

#### Task 1: Refine the general monitoring framework

- 1. <u>Baseline data</u>: Section boundaries will be mapped prior to sampling with Global Positioning System (military grade) and recorded in a Geographic Information System Coverage prior to locating sample plots. Plot-based (Cullinan, Joice) and transect (Tolay) survey techniques will be used. Plots will vary in scale from 250x250, 500x500, to 1,000x1,000 m grids depending on the variable within Universal Transverse Mercator (UTM) blocks (about 150, 75, or 25 samples per project). Biological monitoring samples at Tolay Creek will overlay 9 established cross-sectional transects from the bay edge. All sample locations will be georeferenced to the nearest meter in a horizontal plane with a global positioning system (GPS) and all data will be entered into GIS coverages. Monitoring will be conducted in both dry (May-Oct) and wet (Nov-Apr) seasons. Three-way multivariate (MANOVA) (Johnson and Wichern 1998) or univariate analysis of variance (ANOVA) tests (Zar 1996) will be used to compare most biophysical variables by unit, type, and section. Comparisons will be made to examine changes in variables through time from analysis of variance procedures with time as a repeated measure (Hand and Taylor 1987).
- 2. Hydrological Measurements: We will document initial water flows (flowmeter, 0.1 m/s), sedimentation rates (sediment pins, 1 cm), tidal datum (water level loggers, 0.5 cm), and channel networks (aerial photography, 1 m per pixel, scanned at 800 dpi) on both projects with measurements taken at representative sites within the project boundaries. Our initial estimated sample number is 12 for Tolay Creek (near each transect, each pond, and at the entrance), and 60 for the Cullinan Ranch (every 500 m grid). In addition, ground surveys will be conducted with GPS survey equipment to verify elevational contours. Temperature, pH, turbidity, salinity, and dissolved oxygen will be determined on site from water column samples taken at each plot in the slough channel type. These samples will be taken in conjunction with other monitoring samples on each plot seasonally.
- 3. <u>Biophysical Measurements</u>: Characterization of changes in marsh development as the rehabilitation projects go forward will give us valuable information on wetland restoration processes. Information will be obtained on several variables including water quality, invertebrates, plants, and target fish and wildlife species. These will include annual infrared aerial photographs and *in situ* meters. Digital maps will continue to be updated (see Ecological

Benefits, Linkages). Flora will be measured with 15-m transects (250x250m plots) in a random direction to determine composition (percent occurrence), and a 0.5 m² grid will be examined at 3 m intervals to estimate mean stem density, height, and percent cover. Differences in unit, type, and section will be examined in 3-way MANOVA tests with percent occurrence as the response variable, although transformation of percentages may be required. Invertebrates will be sampled with core samples (10 x 10 cm, 0.5 mm screens), frozen, identified to order or family, counted, dried, and weighed (0.1 mg). Fishes will be sampled (see Task 3) seasonally. Larger birds will be counted with a complete count index and smaller birds with variable circular plots (DeSante 1981) Variable line transect statistics (Burnham et al. 1980) adjusted for circular plot areas (Roeder et al.1987) will be calculated from program DISTANCE to estimate seasonal densities of common species. Playback recordings will be tested on a subsample of plots to augment surveys and improve counts of secretive rail species (Legare et al. 1999, Evens et al. 1991, Marion et al. 1981, Repking and Ohmart 1977). Small mammals will be trapped in 25 trap (10x10 m) rectangular capture grids for 3 mornings and estimated with mark-recapture analyses (White et al. 1982: Program CAPTURE).

#### Task 2: Document community structure and immigration of fish species

Fish species assemblages will be surveyed initially monthly during spring and summer, then monitored seasonally, from sample sites. Multiple gear types will be used to assess the distribution and relative abundance of juveniles and adults. As a minimum, throw nets and experimental (variable mesh) gill nets will be fished at all sites. At sites that can be waded, fish will also be sampled with bag seines. Fishing effort for each gear type will be standardized and replicated to allow for statistical comparisons of fish catch among dates and sites. At each site, captured fish will be identified to species and counted, then the first 25 individuals of each species will be measured for total length and weight. In addition, as many as 25 individuals from selected species will be fixed in 10% formalin for subsequent analysis of gut contents to determine their use of invertebrates. If fishes or fish-forage organisms cannot be reliably identified by project personnel, voucher specimens will be submitted to taxonomic specialists for positive identification. Fish species assemblages and their relation to environmental variables will be identified and tested for significance by using cluster analysis and discriminant analysis (e.g., Green and Vascotto 1978) or other appropriate multivariate statistical procedures.

The rehabilitation projects provide a unique opportunity to examine immigration patterns of fishes. Many fish species use tidal marshes for escape cover from predators, juvenile nurseries, or temporary habitat while transiting the length of the estuary (Day et al. 1989, Josselyn 1983, Moyle 1976). Monitoring of movement into the transitional salt marsh by fish species may provide further information on species range. Thirty individuals of 3 selected species will be captured in the study sites. Each fish will be tagged, weighed, measured, and radio-marked (radio size and lifespan dependent on fish size, but likely 1.1-20.0 g transmitters, 1-4 mo lifespan)(Adams, et. al., 1998). Radio-marked individuals will be tracked daily by observers with handheld antennas on the ground or from small tower telemetry systems (Huber and Kirshhofer, 1998). Data will be entered daily into a laptop computer after locations are determined (Dodge and Steiner 1986, Dodge et al. 1986). Home range areas (Samuel and Garton 1985) and core areas (Samuel and Green 1988) of the radio-marked animals will be documented.

#### Task 3: Salt Marsh and Western Harvest Mouse Genetic Differentiation

The Salt Marsh Harvest Mouse (Reithrodontomys raviventris: SMHM) is a federally listed endangered species endemic to the San Francisco Bay and Delta. This mouse makes its home in the high saline environment of tidal salt marshes. The Western Harvest Mouse (Reithrodontomys megalotis: WHM) is a common species in western North America, occurring in a variety of open habitats, including grasslands and salt marshes. These two species occur together and are difficult to differentiate. Shellhammer (1984) developed a rough method for field identification of the South Bay subspecies based on a numeric key of scorable differences in external morphology (i.e., tail shape and color). This key has proven less effective in the North Bay. E. Steinberg (Univ. of Washington, unpubl. data) found that the two species of mice are difficult to separate morphologically in the North Bay region and that individuals are being misidentified. However, Steinberg developed nucleic acid primers that clearly distinguishes the two species and requires only a few hairs for DNA testing by polymerase chain reaction (PCR). We will obtain hair samples from 30 SMHM and 30 WHM at or adjacent to each of the 3 sites. We will use morphological measurements on several external characteristics to attempt to develop a parsimonious key to the species identified by DNA through their hair samples with a discriminant function analysis (see Orthmeyer et al. 1995).

#### Task 4: Experimental Features to Enhance Use by Shorebirds and Waterfowl

The recent San Francisco Bay Regional Wetland Ecosystem Goals Project (Goals Project 1999) indicated that information was needed to identify features which enhance wetland restoration projects for shorebirds and waterfowl. We will work with the project designers to create experimental islets, levees, and subsurface structures to examine the feasibility and value of certain design elements. Each feature will be replicated in at least three locations, but not necessarily at each site. Abundance of species will be examined at these features seasonally, and compared with samples taken in the standard surveys (Task 1) with nonparamentric univariate statistical tests to determine whether enhanced features in wetland restorations may enhance target species.

Tasks 2, 3, and 4 cannot be accomplished if Task 1 is not funded.

#### Location and/or Geographic Boundaries of the Project

Three units will be examined in this study plan (see attached maps 1 & 2): two restoration sites and one an existing marsh site. The primary restoration site is the 606 ha Cullinan Ranch, located 6 km west of Vallejo, California on the northern edge of San Pablo Bay, north of Highway 37. Cullinan Ranch has been drained and cultivated for oat hay production since the late 1800s. The Tolay Creek site (176 ha) is located 16 km west of Vallejo south of Highway 37. Project construction has been recently completed; post-project monitoring is required to track the transition to marsh habitat. The Suisun Bay site is at the Joice Island Refuge (850 ha), located between the Suisun and Montezuma Sloughs, of the California Department of Fish and Game and will include 250 ha of existing tidal marsh as a comparison site. Site locations are: Cullinan Ranch, Lat. 38°07"30' N, Long. 122°20"00' W; Tolay Creek, Lat. 38°07"30' N, Long. 122°27"30' W; Joice Island; Lat. 38°07"00' N, Long. 122°06"30' W.

#### IV. ECOLOGICAL/BIOLOGICAL BENEFITS

Although many wetland rehabilitation projects have been initiated, few have included detailed monitoring plans to confirm their intended success through establishment of target species. This project will develop designs to accomplish this task and apply these designs in two North Bay wetland restoration sites with a Suisun Bay comparison site.

#### Ecological/Biological Objectives

San Francisco Bay and the delta of the Sacramento and San Joaquin Rivers form one of the largest estuaries in the world (Conomos 1979, Sudman 1981). Two-thirds of the remaining salt marsh ecosystems and tidal flat habitats on the Pacific Coast are located in the San Francisco Estuary (SFE) (Josselyn 1983). However, 95% of wetlands in the SFE have been lost to filling and dredging for urban development or agricultural purposes (Nichols et al. 1986). The quality of remaining wetlands is endangered by accumulation of toxins from agricultural and urban runoff, introduction of contaminants from industrial and municipal discharge, accidental spills from petroleum and chemical transport, and freshwater diversions.

Despite extensive habitat loss and degradation, the SFE is a critical ecosystem for many rare endemic species and Pacific Flyway migratory birds. The population of shorebirds in the SFE is estimated to be 1 million birds (Stenzel and Page 1988), and the SFE supports nearly 700,000 waterfowl in the Pacific Flyway during winter (USFWS, midwinter surveys, unpubl. data). Several animal species in the SFE are currently listed as federal or state threatened or endangered, under consideration for listing, or of state special concern (Harvey et al. 1992). These species include the Delta Smelt, Sacramento Splittail, Salt marsh harvest mouse, San Pablo Vole (Microtus californicus), Salt marsh wandering shrew (Sorex vagrans halicoetes), Suisun ornate shrew (S. ornatus sinuosus), California Clapper Rail, California Least Tern (Sterna antillarun browni), California Black Rail, Long-billed Curlew (Numenius americanus), San Pablo Song Sparrow, Saltmarsh Common Yellowthroat (Geothlypis tirchas sinuosa), and Peregrine Falcon (Falco peregrinus anatum).

Several wetland rehabilitation projects are underway or have been completed in the SFE. Biophysical monitoring to document results of wetland rehabilitation projects is a necessary step which was identified by CALFED in their requirements for recent wetland restoration and rehabilitation projects. Yet, few guidelines exist which indicate how monitoring should be conducted on a project-by-project basis, and even fewer funds are available with which to accomplish this task. Information from monitoring is critical for adaptive management of restoration projects; it tells us whether specific features within the project may enhance target species populations. Monitoring information is also critical to determine success of habitat restoration projects. The primary goal of this project is to use baseline information and information obtained from monitoring changes in the biological and physical resources as the project continues, to refine and standardize monitoring techniques. We propose to document baseline biological data, develop a monitoring framework and plan for each area, examine immigration and community patterns of fish species, and experimentally determine features which enhance use by shorebirds and waterfowl.

Tidal marshes and their associated channels and subtidal waters are ecologically important to many species of aquatic plants and animals in the estuary (Josselyn 1983). With regards to fish,

only a relatively small number of species are truly estuarine and depend on these habitats throughout their life cycle (e.g., delta smelt; see Moyle 1976). By comparison, numerous other species spend just a portion of their life cycle in estuaries. These include freshwater species that occasionally enter brackish water (e.g., Sacramento blackfish, Orthodon microlepotus; splittail; tule perch, Hysterocarpus traski; prickly sculpin, Cottus asper), estuarine-marine species that use the estuary primarily as a nursery ground (e.g., Pacific herring, Clupea harengeus; topsmelt, Atherinops affinis; California halibut, Paralichthys californicus; starry flounder, Platichthys stellatus), marine species that visit estuaries in search of food (e.g., bat ray, Myliobatis californicus; brown smoothhound, Rhinotriakis henlei; California skate, Raja inornata), and anadromous species in transit through the estuary (e.g., striped bass, Morone saxatilis; chinook salmon, Oncorhynchus tshawytscha; steelhead, O. mykiss; white sturgeon, Acipenser transmontanus; Pacific lamprey, Lampetra tridentata).

The relative importance of natural and restored tidal marshes as habitat for fishes has not been rigorously examined because population comparisons are confounded by differences in sampling techniques such as gear type, fishing method, fishing effort, sampling daytime, and sampling season. A search of literature published since 1980 yielded relatively few studies that directly compared aquatic communities in restored tidal marshes with those in natural or reference marshes. In the Bay and Delta estuary, several tidal marshes and channels (both natural and restored) and their adjacent subtidal waters have been intensively surveyed for fishes. Some examples of tidal marshes and channels from which fisheries data are available include the, Suisun Marsh (Moyle et al. 1982, 1986; Meng et al. 1994), Napa Marsh (Madrone Associates 1977), and Hayward Marsh (Woods 1981). Subtidal waters from which fisheries data are available include Richardson Bay (Green 1975) and San Pablo Bay (Brown and Caldwell 1980). In addition, the U. S. Fish and Wildlife Service and the California Department of Fish and Game have conducted annual surveys for juvenile chinook salmon and steelhead, and for larval, juvenile, and adult striped bass in various locations throughout the estuary. Collectively, these surveys documented the presence of 69 native and 25 introduced fish species (attached Tables I & II). However, Jones and Stokes (1979, cited by Josselyn 1983) reported that as many as 121 species of fish have been recorded from San Francisco Bay, of which only 16 species are expected to occur in tidal marshes. We do not have a clear picture of how the restoration projects are used during the transition from pre-project to restoration.

Restoration projects targeted at particular species often have a narrow focus, limited information, or lack knowledge effects on the larger ecosystem. Recent information on the Salt Marsh Harvest Mouse indicates that the mouse may have a larger range of habitat than previously indicated (Bias and Morrison, in press). Steinberg has reported that morphological differentiation of species may not clearly distinguish the Salt Marsh Harvest Mouse from the Western Harvest Mouse. Increased knowledge, through further research, will help us understand the habitat that this listed species needs to increase populations. This same rationale applies to restoration projects that provide habitat for salt marsh species, but neglect present or potential future use of these areas by waterfowl and shorebirds.

#### Linkages

This project is linked directly to previous CALFED funding for the Tolay Creek and Cullinan Ranch projects granted to Ducks Unlimited (Michael A. Bias project manager). The construction

phase of the Tolay Creek project has been completed as well as pre-project monitoring. Post-project monitoring is being conducted as the site transitions from non-tidal to tidal. The Cullinan Ranch project is still in the pre-project phase and construction is expected to begin next year.

This project addresses several topics in the CALFED Ecosystem Restoration Program Plan. It is located in the North Bay zone (V. II, p. 75). Elements of the project address saline emergent wetland restoration (V.I., p. 9), and it may aid recovery and information on several species of importance including Delta smelt (V. I, p. 10), Splittail (V. I, p. 10), resident fishes (V. I, p. 11), Red-legged frogs (V. I, p. 11), California Clapper Rail (V. I, p. 12), California Black Rail (V. I., p. 12), Suisun Song Sparrow (V. I, p. 12), Salt Marsh Harvest Mouse (V. I, p. 12), Shorebird and Wading Birds (V. I, p. 12), and Waterfowl (V. I, p. 12), Levees and bank protection (V. I, p. 13), Invasive Aquatic Plants (V. I, p. 13), Invasive Aquatic Organisms (V. I, p. 14), and Invasive Riparian and Salt Marsh Plants (V. I, p. 14). Habitats addressed included Natural Sediment Supply (V. I., p. 27), Floodplains and Processes (V. I, p. 38), Tidal Perennial Aquatic Habitat (V. I, p. 75), Saline Emergent Wetlands (V. I, p. 88). Finally, this project provides a strong basis for establishing adaptive management (V. III, p. 11) and biological monitoring (V. III, p. 35) in wetland restoration.

#### System-Wide Ecosystem Benefits

The ongoing tidal marsh restoration projects provide potential increased water quality by nutrient removal to the marsh and sediment storage capacity. The restoration of the Tolay Creek tidal action has provided benefits by providing greater aquatic habitat which has increased the numbers of waterbirds using the general area. The proposed monitoring and experimental studies should provide an information base for future rehabilitation projects in the ecosystem.

#### Compatibility with Non-Ecosystem Objectives

This project provides benefits for other CALFED objectives in by refining monitoring techniques and furnishes a framework for the standardization of monitoring plans. The tidal restoration projects also supply increased floodplain by breaching levees. The proposal would also benefit the San Pablo Bay National Wildlife Refuge because the projects are within the refuge; the NOAA-NMFS studies of anadramous fish; and the Marin-Sonoma County Mosquito Abatement as restoring tidal action decreases mosquito breeding habitat. Third party benefits include increased environmental education, recreational, and aesthetic values for 12 million residents of the North Bay.

#### VI. TECHNICAL FEASIBILITY AND TIMING

The project is fully implementable with permits obtained through the U. S. Fish and Wildlife Service and California Department of Fish and Game held by the Biological Resources Division of the U. S. Geological Survey. The PI's in this project have previously conducted projects of this magnitude and scope in a timely and professional manner.

#### VII. MONITORING AND DATA COLLECTION METHODOLOGY

This project proposal addresses monitoring and data collection, thus, most of the detail is included in the Proposed Scope of Work (IV). Annual progress reports will be submitted during the study, with a final report at the end of the study. Results will be submitted to a peer reviewed journal for one or more publications.

### Biological/Ecological Objectives

See Proposed Scope of Work.

### Monitoring Parameters and Data Collection Approach

See Proposed Scope of Work.

#### **Data Evaluation Approach**

See Proposed Scope of Work.

Table 2. Monitoring and Data Collection Information

I) Biological/Ecological Objective	res		
Hypothesis/Question to be Evaluated	Monitoring Parameters and Data Collection Approach	Data Evaluation Approach	Comment/ Data Priority
Do different monitoring methods provide similar information about biophysical parameters in rehabilitation projects?	Seasonal plot/transect sampling biological and physical parameters at multiple sites	Temporal and spatial statistical comparisons	1
Are restoration projects providing increased habitat for fish; what is the community structure and use (immigration, movements)?	Plot/transect sampling and identification of species, radio-marking to monitor movements	Temporal and spatial statistical comparisons	2
Can Salt Marsh Harvest Mice be distinguished from Western Harvest Mice reliably by external morphological characteristics?	Sample collection by site, field identification of species, lab analysis and identification of species samples	Compare genetic results to field key results, statistical evaluation	. 3
Can artificial structures enhance waterfowl and shorebird use of project areas?	Bird surveys by for use by plot/transect and structure	Temporal and spatial statistical comparisons	4

#### VIII. LOCAL INVOLVEMENT

This project will take place on the Tolay Creek and Cullinan Ranch units of the San Pablo Bay National Wildlife Refuge, and Joice Island owned by California Department of Fish and Game. The Refuge will fully support all activities related to the project. County Notification for the Tolay Creek project was given with the EA and the Sonoma County conservation District is a partner in the project (see attached). County Notification for the Cullinan Ranch project is pending with the EA and the county has been contacted via phone.

Rehabilitation and restoration projects initiated by the refuge enjoy cooperation with several local partners, including the California Dept. of Fish and Game, Ducks Unlimited, and the Southern Sonoma County Resource Conservation District, the Save San Francisco Bay Association and Vallejo Sanitation District, among others.

No potential third party effects are expected.

# IX. COST

. for this project are \$689,000 for three years (see Table III).

# t for three years

t y its	Service Contracts	Material and Acquisition Contracts	Miscel- laneous and other Direct Costs	Overhead and Indirect Costs	Total Cost
36	30000	0	94982	0	376018
34	0	0	14000	0	69134
74	27000	0	4200	0	132774
34	30000	. 0	3500	0	88634
44	0	0	0	0	22464

# udget

Quarterly Budget Jan-Mar 00	Quarterly Budget Apr-Jun 00	Quarterly Budget Jul-Sep 00	Quarterly Budget Oct-Dec 00	Total Budget
31335	31335	31335	31335	156675
5761	5761	5761	5761	28805
11065	11064	11065	11064	55322
7386	7386	7386	7386	36930
205	206	205	205	1027

#### Schedule

Task	Start/ Completion Dates
■Acquire equipment, hire and train field staff, begin sampling. ■Continue biological monitoring program studies. ■Initiate studies of fish immigration and community structure. ■Initiate sampling of Salt Marsh Harvest Mice and Western Harvest Mice. ■Develop structures for enhanced marsh use by waterbirds.	FY 00
■Continue biological monitoring program studies. ■Continue studies of fish immigration and community structure. ■Initiate genetic study of Salt Marsh Harvest and Western Harvest Mice. ■Monitor use of enhanced structures by waterbirds.	FY 01
<ul> <li>Continue biological monitoring program studies.</li> <li>Complete genetic study of Salt Marsh Harvest and Western Harvest Mice.</li> <li>Complete studies of fish immigration and community structure.</li> <li>Complete study of use of enhanced structures by waterbirds.</li> <li>Data analysis and report preparation.</li> </ul>	FY 02

## X. COST-SHARING

No other pertinent funding commitments are in process for this proposal. Cost-sharing contributions from the U. S. Geological Survey include those listed in the following table.

Cost-share requirement	Cost per year	Total
P.I. John Takekawa	\$15,000	\$45,000
Vehicles	\$2,000	\$6,000
Miscellaneous	\$1,000	\$3,000
Total	\$18,000	\$54,000

# XI. APPLICANT QUALIFICATIONS

#### John Y. Takekawa, PhD.

John Y. Takekawa's research specialty is the ecology of migratory waterbirds. He has been a Research Wildlife Biologist with the Department of the Interior since 1986. For the past 13 years, his studies have focused on the Pacific Rim, California and San Francisco Bay. He established the San Francisco Bay Estuary Field Station located on San Pablo Bay in 1995. John Takekawa will serve as principal investigator for the project, and will coordinate all activities, equipment and personnel.

#### Relevant Work Experience

- August 1995 to present. Wildlife Biologist (Research), U.S. Dept. of Interior, U.S. Geological Survey, Biological Resources Division, Western Ecological Research Center, San Francisco Bay Estuary Field Station, Vallejo, CA.
- October 1993 to August 1995. Wildlife Biologist (Research), U. S. Dept. of Interior, National Biological Survey, California Pacific Science Center, Dixon, CA.
- October 1986 to October 1993. Wildlife Biologist (Research), U. S. Dept. of Interior, FWS, Northern Prairie Wildlife Research Center, Pacific States Ecology Station, Dixon, CA.

#### Education

- Ph.D. 1987, Iowa State University, Ames, Iowa; Animal Ecology, Statistics minor
- M.S. 1982, University of Idaho, Moscow, Idaho; Wildlife Resources
- **B.S.** 1979, University of Washington, Seattle, Washington; Wildlife Science/Forestry

#### Selected Publications

- Hui, C. A., J. Y. Takekawa, V. V. Baranyuk, and K. V. Litvin. 1998. Trace element concentrations in two subpopulations of Lesser Snow Geese from Wrangel Island, Russia. Arch. Environ. Contam. Toxicol. 34:197-203.
- Kuznetsov, S. B, V. V. Baranyuk, and J. Y. Takekawa. 1998. Lack of genetic differentiation between wintering populations of lesser snow geese from Wrangel Island, Russia. Auk. 115:00-00. (In press).
- J. Y. Takekawa and N. Warnock. 1998. The Long-billed Dowitcher (*Limnodromous scolopaceus*). Birds of North America. (*In press*).
- Whitworth, D. L., J. Y. Takekawa, H. R. Carter, and W. R. McIver. 1997. A night-lighting technique for at-sea capture of Xantus' Murrelets. Colonial Waterbirds 20:525-531.
- Ely, C. R., D. C. Douglas, A. C. Fowler, C. A. Babcock, D. V. Derksen, and J. Y. Takekawa. 1997. Migration behavior of tundra swans from the Yukon-Kuskokwim Delta, Alaska. Wilson Bull. 109:679-692.
- Ely, C. R., and J. Y. Takekawa. 1996. Geographic variation in migratory behavior of greater white-fronted geese (*Anser albifrons*). Auk 113:889-901.

#### Michael A. Bias, PhD.

Michael A. Bias's expertise with small mammals makes his technical advice valuable in studying the Salt Marsh harvest Mouse. He holds a doctorate from U. C. Berkeley in Wildland Resource Science on Ecology of the Salt Marsh Harvest Mouse in the San Pablo Bay. His work has

focused on wetland and wildlife ecology, on small mammals and Salt Marsh Harvest Mice.

#### Education

Ph.D. 1994, University of California, Berkeley, CA; Wildland Resource Science

M.S. 1989, Humboldt State University, Arcata, CA; Wildlife Management

B.S. 1984, Unity college, Unity, ME.; Wildlife Science

#### Selected Publications

Bias, M. A. and M. L. Morrison. In press. Movements and home range of salt marsh harvest mice. The southwestern Naturalist.

Bias, M. A. and J. M. Payne. 1997. Agriculture and wildlife in California's Central Valley; mutually exclusive or win-win? p. 47-57. in: J. Schaack and S.S. Anderson, eds. Water for Agriculture and Wildlife and the Environments, Win-Win Opportunities. Proceedings from the 1996 USCID wetlands seminar. Bismarck, ND, June 27-29, 1996. U.S. Committee on Irrigation and Drainage. Denver, CO. 323pp.

Bias, M. A., N. L. Breuner, and M. L. Morrison. 1992. House mice as indicators of marking effects on salt marsh harvest mice. Transactions of the Western Section of The Wildlife Society 28:34-37.

#### C. Michael K. Saiki, PhD.

Michael K. Saiki has successfully completed several field projects on fish communities during the past 15 years. His studies include abundance and distribution of fishes in rivers or small estuaries in which fish populations were documented and related to the food supply, water quality, or other environmental variables.

#### Education:

Ph.D. 1976, Biology, University of Arizona, Tucson

M.S. 1973, Fishery Biology, University of Arizona, Tucson

B.A. 1971, Zoology, University of Hawaii, Honolulu

#### **Selected Publications**

Martin, B.A., and M.K. Saiki. In press. Effects of ambient water quality on the endangered Lost River sucker in Upper Klamath Lake, Oregon. Transactions of the American Fisheries Society.

Saiki, M.K., D.P. Monda, and B.L. Bellerud. 1999. Lethal levels of selected water quality variables to larval and juvenile Lost River and shortnose suckers. Environmental Pollution 105:37-44.

Saiki, M.K. 1997. Survey of small fishes and environmental conditions in Mugu Lagoon, California, and tidally influenced reaches of its tributaries. California Fish and Game 83:153-167

Saiki, M.K., and R.S. Ogle. 1995. Evidence of impaired reproduction by western mosquitofish inhabiting seleniferous agricultural drainwater. Transactions of the American Fisheries

#### VII. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

See attached documents.

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Table I. Native fish species present in San Francisco Bay System surveys (Wild 1969, Green 1975, Madrone Associates 1977, Brown and Caldwell 1980, Woods 1981, Moyle et al. 1986, White 1990).

Arrow goby, Clevelandia ios Barred surfperch, Amphistichus argenteus Bat ray, Myliobatis californicus Bay pipefish, Syngnathus leptorhynchus Bay goby, Lepidogobius lepidus Black perch, Embiotoca jacksoni Brown rockfish, Sebastes auriculatus Brown smoothhound shark. Rhinotriakis Buffalo sculpin, Enophrys bison Butter sole, Pleuronectes isolepia Cabezon, Scorpaenichthys marmoratus California skate. Raia inornata California halibut, Paralichthys California tonguefish, Symphurus Cheekspot goby, *llypnus gilberti* Chinook salmon, Oncorhynchus Delta smelt, Hypomesus transpacificus Diamond turbot, Hypsopsetta guttulata Dover sole, Microstomus pacificus Dwarf perch, Micrometrus minimus English sole, Paraphrys vetulus Eulachon, Thaleichthys pacificus Green sturgeon, Acipenser medirostris Jack mackerel, Trachurus symmetricus Jacksmelt, Atherinopsis californiensis Kelp greenling, Hexagrammos Leopard shark, Triakis semifasciata Lingcod, Ophiodon elongatus Longfin smelt, Spirinchus thaleichthys Longjaw mudsucker, Gillichthys mirabilis Northern anchovy, Engraulis mordax Onespot fringehead, Neoclinus uninotatus Pacific hake, Merluccius productus Pacific herring, Clupea harengeus Pacific lamprey, Lampetra tridentata

Pacific pompano, Peprilus simillimus Pacific sanddab. Citharichthys sordidus Pacific staghorn sculpin, Leptocottus Pacific torncod, Microgadus proximus Pile perch, Rhacochilus vacca Plainfin midshipman, Porichthys notatus Prickly sculpin, Cottus asper Rainbow seaperch, Hypsurus caryi Rainbow trout, Oncorhynchus mykiss Red brotula. Brosmophycis marginata Roughtail skate, Raja trachura Rubberlip seaperch, Rhacochilus toxotes Sacramento sucker, Catostomus Sacramento squawfish, Ptychocheilus Sacramento blackfish, Orthodon Sacramento perch, Archoplites interruptus Sacramento hitch, Lavinia exilicauda Sacramento splittail, Pogonichthys Sand sole, Psettichthys melanostictus Shiner perch, Cymatogaster aggregata Speckled sanddab, Citharichthys stigmeus Spiny dogfish, Squalus acanthias Starry flounder, *Platichthys stellatus* Surf smelt, Hypomesus pretiosus Threespine stickleback, Gasterosteus Tidepool sculpin, Oligocottus maculosus Topsmelt, Atherinops affinis Tule perch. Hysterocarpus traski Walleye surfperch, Hyperprosopon White seabass, Cynoscion nobilis White seaperch, Phanerodon furcatus White sturgeon, Acipenser transmontanus White croaker, Genvonemun lineatus Whitebait smelt, Allosmerus elongatus

Table II. Introduced fish species present in San Francisco Bay System surveys (Wild 1969, Green 1975, Madrone Associates 1977, Brown and Caldwell 1980, Woods 1981, Moyle et al. 1986, White 1990).

American shad, Alosa spadissima
Bigscale logperch, Percina macrolepida
Black bullhead, Ictalurus melas
Black crappie, Pomoxis nigromaculatus
Bluegill, Lepomis macrochirus
Brown bullhead, Ictalurus nebulosus
Chamelion goby, Tridentiger trigonocephalos
Channel catfish, Ictalurus punctatus
Common carp, Cyprinus carpio
Fathead minnow, Pimephales promelas
Golden shiner, Notemigonus crysoleucus
Goldfish, Carassius auratus
Green sunfish, Lepomis cyonellus

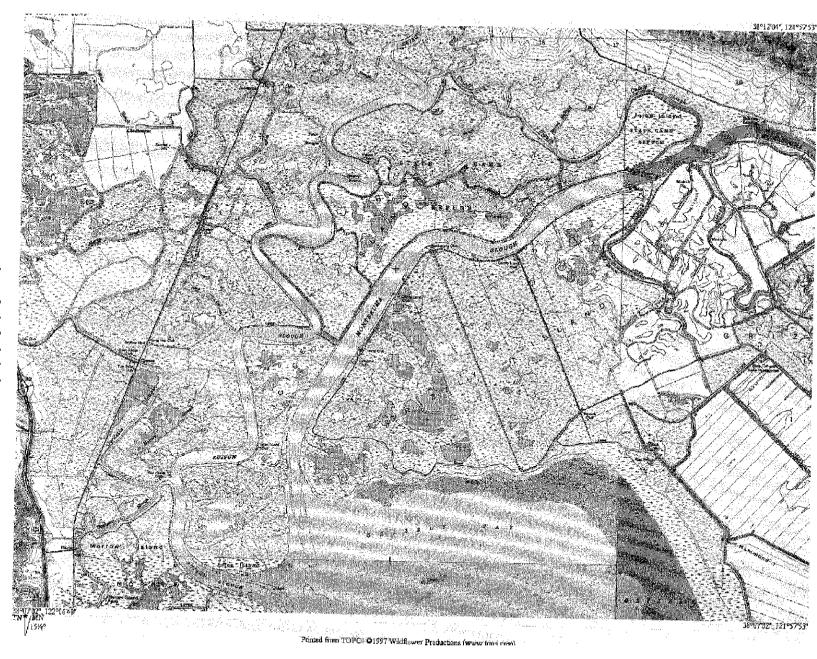
Inland silverside, Menidia beryllina
Largemouth bass, Micropterus salmoides
Mississippi silverside, Menidia audens
Mosquitofish, Gambusia affinis
Oriental goby, Acanthogobius flavimanus
Rainwater killifish, Lucania parva
Smallmouth bass, Micropterus salmoides
Striped bass, Morone saxatilis
Threadfin shad, Dorosoma petenense
Warmouth, Lepomis gulosus
White catfish, Ictalurus catus
Yellowfin goby, Acanthogobius flavimanus

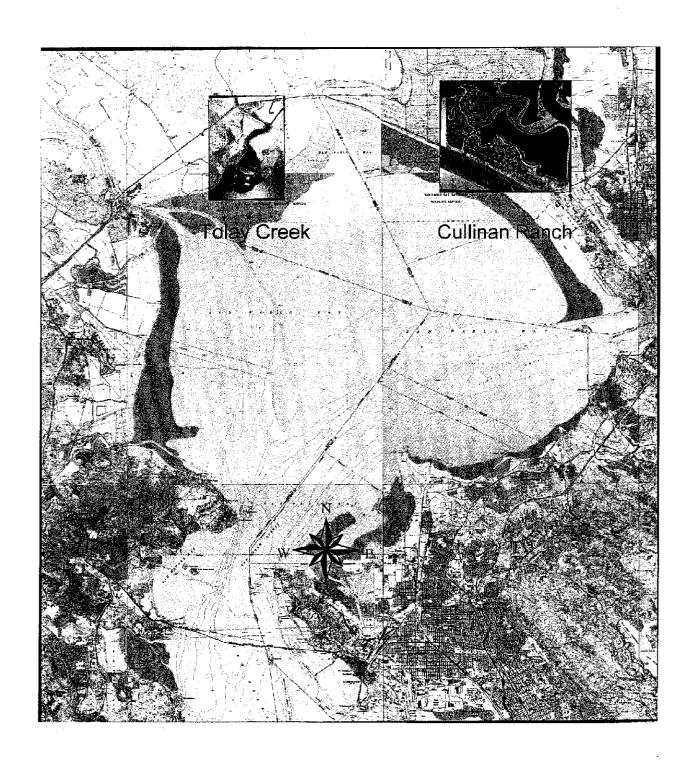
Table III. Estimated Budget

Category	Year	• .		
	1999	2000	2001	TOTAL
SALARY COSTS				
Principle Investigator	15480	15480	15480	46440
Wetland Biologist 1,2 (two positions)	81200	83636	86200	251036
Biological Technician (two positions) <sup>1,2</sup>	53500	55100	56800	165400
Subtotal Salary Costs	150180	154216	158480	462876
EQUIPMENT COSTS			,	
Computer (w/ArcView & Image Analyst, Spatial Analyst)	7500	2500	3500	13500
Laptop (data logger download)	3000	500	500	4000
Stereo Microscope (Invertebrate & plant ID)	3000	100	100	3200
Water level loggers (12@\$1.5K, install@\$1K)	11200	1000	1000	13200
Hydrolab H2O Multiprobe & Display	6500	1000	1000	8500
Water analyzer (water quality)	2500	200	200	2900
Current meter (water flow)	2000	50	50	2100
All Terrain Vehicle (for levee roads)	6000	500	500	7000
Sherman live traps (100@\$12)	1200	0	0	1200
Subtotal Equipment Costs	42900	5850	6850	55600
OPERATING COSTS				
SUPPLIES				
Radio Transmitters (100 @ \$135)	1350	1350	0	2700
Field & office (seines, bait, copies, disks)	6500	3500	2500	12500
Laboratory materials (chemicals, instruments)	2500	1500	1000	5000
Collection supplies (nets, bottles, labels, scales)	2500	1500	1500	5500
Annual report and publication costs	600	600	1500	2700
TRAVEL				

Category	Year			
	1999	2000	2001	TOTAL
Boat and trailer maintenance & gas	2500	2500	2500	7500
Mileage (100 mi/d @ \$0.32/mi)	3840	3840	3840	11520
Miscellaneous (meals, lodging, etc.)	1000	1000	1000	3000
CONTRACTS				
Aerial Photography (scanned 800dpi, digitized-1 photo/site)	6000	6000	6000	18000
DNA sample analysis (180 samples @\$150)	0	27000	0	27000
Elevation Survey (survey grade GPS, level)	4000	4000	4000	12000
Heavy Equipment Operation	30000	0	0	30000
<b>Subtotal Operating Costs</b>	210970	209970	182320	603260
Subtotal Project Costs	247870	215320	188670	658860
Project Admin Costs (5% less equipment)	10549	10499	9116	30164
TOTAL COSTS	258419	225819	197786	689024

<sup>&</sup>lt;sup>1</sup>Temporary salary costs increased 3% per annum to cover cost-of-living changes <sup>2</sup>Benefits 15%





Agreement No	
Exibit	

#### ADDITIONAL STANDARD CLAUSES

Recycled Materials. Contractor hereby certifies under penalty of perjury that \_\_\_\_\_ (enter value or "0" here) percent of the materials, goods and supplies offered or products used in the performance of this Agreement meets or exceeds the minimum percentage of recycled material as defined in Sections 12161 and 12200 of the Public Contract Code.

Severability. If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

Governing Law. This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

Y2K Language. The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

Child Support Compliance Act. For any Agreement in excess of \$100,000, the Contractor acknowledges in accordance therewith, that:

- The Contractor recognizes the importance of child and family support obligations and shall fully comply with all
  applicable state and federal laws relating to child and family support enforcement, including, but not limited to,
  disclosure of information and compilance with earnings assignment orders, as provided in Chapter 8 (commencing
  with Section 5200) of Part 5 of Division 9 of the Family Code; and
- The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

DWR 4099A (Rev.1/99)

- DEPARTMENT OF WATER RESOUR	$rac{1}{2}$	c	^
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EPARIMENT OF WATER RESOURCES	Ine Hesources Agenc
	Agreement No.
	Exhibit

### STANDARD CLAUSES -CONTRACTS WITH THE UNITED STATES

State of California

Workers' Compensation Clause. Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract. This provision shall apply to the extent provided by federal laws, rules and regulations.

Claims Dispute Clause. Any claim that Contractor may have regarding the performance of this agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the Director, Department of Water Resources, within thirty days of its accrual. State and Contractor shall then attempt to negotiate a resolution of such claim and process an amendment to this agreement to implement the terms of any such resolution. However, Contractor does not waive any rights or duties it may have as may be provided by federal laws, rules and regulations.

Nondiscrimination Clause. During the performance of this contract, the recipient, contractor and its subcontractors shall not deny the contract's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3. Title 2 of the Government Code (Government Code Sections 11135 - 11139.5), and the regulations or standards adopted by the awarding State agency to implement such article. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding Sate agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

Availability of Funds. Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

Audit Clause. For contracts in excess of \$10,000, unless otherwise provided by federal laws, rules or regulations, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546,7).

Payment Retention Clause. Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

Reimbursement Clause. If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: Valle, o

Americans With Disabilities Act. By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to

Conflict of Interest. Current State Employees: a) No State officer or employee shall engage in any employment, activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity or enterprise is required as a condition of regular State employment. b) No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.

Former State Employees: a) For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-mouth period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

DWR 4247 (Rev. 9/95)

### Distribution List for Tolay Creek Restoration Plan and Environmental Assessment

#### Federal Agencies

- U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Department of the Army, Corps of Engineers
- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Department of Interior, Regional Environmental Officer
- U.S. Environmental Protection Agency, Wetlands and Coastal Planning
- U.S. Fish and Wildlife Service, Ecological Services Division

#### State and Local Agencies

Association of Bay Area Governments

California Department of Fish and Game

California Department of Transportation

California Department of Water Resources

California State Coastal Conservancy

California State Lands Commission

California State Parks and Recreation Department

California State Water Resources Control Board, Water Quality and Water Rights

Marin-Sonoma Mosquito Abatement District

Regional Water Quality Control Board

San Francisco Bay Conservation and Development Commission

Sonoma Agricultural Preservation and Open Space District

#### Individuals and Other Groups

John Alves

Bill Bisso

William Bodeau

California Waterfowl Association

California Native Plant Society

Citizen's Committee to Complete the Refuge

Fred W. Dickson

Ned Dickson

Robert Dickson

**Ducks Unlimited** 

Theodore Eliot, Jr.

Federated Coast Miwok

Gamma Development Corporation

Harvey Goldberg

Golden Gate Audubon Society

Greenbelt Alliance

Integrity in Natural Resources

Marin Audubon Society

exchange for continued access of official vehicles

Assist in oversight of levee construction

Shell Oil Spill Litigation Settlement Trustee Committee

 Provide \$190,000 in funds for construction and widening of tidal channels in the floodplain

# Environmental Protection Agency

- Provide assistance in regulatory issues
- Provide assistance in developing monitoring and mitigation plan
- Provide \$45,000 in funds to complete project

# Save San Francisco Bay Association

- Provide \$75,000 in funds for construction
- Provide assistance in public relations

SIGNATURES:	
uant.	7/24/97
Wayne White, Acting Assistant Regional Director - CV/SFB Ecoregion	
U.S. Fish and Wildlife Service	
Alers Stams 12 Nov. IT	
Alexis Strauss, Acting Director, Water Division	
Environmental Protection Agency	
Then O. Wyn.	11/197
Hank Wyman, Acting State Conservationist	
Natural Resources Conservation Service	
Bundlet	7/18/97
Jacqueline E. Schafer, Director	
California Department of Fish and Game	
Tish ward 8/26	197
Patricia Ward, President	

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	Charles Dill, Manager	xee	8/5/47	<del></del>
	Marin-Sonoma Mosquito Abateme	nt District		
			1/18/97	
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	J. Michael Hoehp, Manager		1/29/97	<del></del>
	Vallejo Sanitation and Flood Contr	ol District		
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- Arrange for engineering design
- Submit Corps of Engineers permit for Tolay Creek construction
- Submit BCDC consistency determination for actions occurring on the Refuge
- Provide oversight during construction phase
- Complete National Environmental Policy Act compliance
- Gather information necessary to include parking lot in design
- Act as lead to coordinate monitoring throughout project
- Provide staff and logistical support plus \$230,000 funds for construction
- Participate in monitoring of the project

#### Natural Resources Conservation Service

- Provide technical assistance for planning the project
- Assist in field work related to project

# Act as lead for mitigation portion of restoration project

- Write mitigation plan and monitoring plan for 53-acre mitigation site
- · Submit paperwork required to amend Corps of Engineers levee permit for mitigation site
- Submit necessary paperwork to BCDC to satisfy mitigation permit requirements
- Apply for Caltrans encroachment permit for new levee and parking lot
- Take lead on placement of slope protection along Highway 37
- Take lead on field surveys required during construction phase
- Assist in directing funds
- Assist in compilation of Memorandum of Understanding
- Assist in securing funding to ensure levee integrity along Tolay Creek concurrent and consistent with the Tolay Creek restoration project

- Assist with construction contracting
- Assist in directing funds to contractors
- Assist with construction oversight
- Construct sprite channels as needed
- Assist in monitoring

# California Department of Fish and Game

- Acquire property for 53- acre mitigation site
- Review engineering design
- · Conduct portions of mitigation monitoring
- Assist with construction oversight on new levee
- Assist with mitigation and monitoring plan
- Participate in monitoring of project

# Selection and Distance Selection

- Sell 53.5 acres for mitigation restoration site
- Maintain and/or re-core levees on District property with \$50,000 in project funds in

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